

# Colonialism, Computerized

## The Canada Land Inventory and the Canada Geographic Information System at Library and Archives Canada

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Article abstract

This article argues for the incorporation of a transdisciplinary approach to cartographic materials in archives, especially in relation to archival description and preservation. Delving into the theoretical foundations and developments in the fields of archival studies and cartography, it explores the creation of cartographic materials and focuses on their processing by archives (i.e., their appraisal, arrangement, description, and preservation and the means of making them available to archival researchers). The lag between theoretical developments and practical applications is illustrated through the creation and management of the Canada Land Inventory (CLI) and Canada Geographic Information System (CGIS) materials held by Library and Archives Canada. An analysis of the creation and ongoing management of these materials highlights the role of cartography and archives in the formation of Canada as a modern colonial state and in the ongoing dispossession of Indigenous Peoples.

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## The Canada Land Inventory and the Canada Geographic Information System at Library and Archives Canada

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**ABSTRACT** This article argues for the incorporation of a transdisciplinary approach to cartographic materials in archives, especially in relation to archival description and preservation. Delving into the theoretical foundations and developments in the fields of archival studies and cartography, it explores the creation of cartographic materials and focuses on their processing by archives (i.e., their appraisal, arrangement, description, and preservation and the means of making them available to archival researchers). The lag between theoretical developments and practical applications is illustrated through the creation and management of the Canada Land Inventory (CLI) and Canada Geographic Information System (CGIS) materials held by Library and Archives Canada. An analysis of the creation and ongoing management of these materials highlights the role of cartography and archives in the formation of Canada as a modern colonial state and in the ongoing dispossession of Indigenous Peoples.

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**RÉSUMÉ** Cet article plaide en faveur de l'intégration d'une approche interdisciplinaire aux matériaux cartographiques dans les archives, en particulier en ce qui concerne la description et la préservation. Explorant les fondements théoriques et les développements dans les domaines de l'archivistique et de la cartographie, il se penche sur la création des documents cartographiques et leur traitement par les archives (c.-à-d. leur évaluation, leur classement, leur description et leur préservation, ainsi que les moyens de les rendre accessibles aux chercheurs). Le décalage entre les développements théoriques et les applications pratiques est illustré par les documents de l'Inventaire des terres du Canada (ITC) et du Système d'information géographique du Canada (SIG) détenus par Bibliothèque et Archives Canada. Une analyse de la création et de la gestion de ces documents met en évidence le rôle de la cartographie et des archives dans la formation du Canada en tant qu'État colonial moderne et dans la dépossession encore en cours des peuples autochtones.

## Introduction

A shift in the archival conceptualizations of cartographic materials is necessary to more accurately reflect the processes of their creation, use, and reuse. In particular, the lack of critical attention to the subjectivity of maps and digital technologies keeps archival descriptive standards narrow and focused on the content of cartographic records, rather than their contexts.<sup>1</sup> This in turn constricts the scope of perceived uses for cartographic materials as primary source documents in various fields while shoring up the power of the settler-colonial state in subtle yet persistent ways. To address this, archivists might look to contemporary cartographic studies to incorporate a processual approach to these records and to include geo-epistemologies in the process of description. While there are infinite varieties of maps, there are two broad categories of mapping. The first is the forward-looking map, which endeavours to chart possible outcomes with certainty; the second looks to the past, documenting what has happened but with the intention of unlimited ongoing interpretations. The most meaningful iteration includes both concepts simultaneously; to map where you are going, you must know where you have been.<sup>2</sup> Kit Hughes notes that archivists become cartographers when they interact with records, attempting to order the landscape they encounter.<sup>3</sup> While I am not suggesting that the specialized expertise and specific skill sets of archiving and map-making are interchangeable, there are similar challenges facing the two fields. Acknowledging the power of cartographic materials, and of archives, as tools of *ongoing* colonization is a constructive contribution to the processes of reconciliation and decolonization in the Canadian context. In this article, I make an argument for incorporating a transdisciplinary approach to cartographic materials in archives, especially in relation to archival description and preservation.

The cartographer, geographer, and map historian John B. Harley suggests that maps should be read as cultural texts, actively deconstructed to uncover

1 Terry Cook, "The Concept of the Archival Fonds in the Post-Custodial Era: Theory, Problems and Solutions," *Archivaria* 35 (Spring 1993): 24–37; Richard Dancy, "RAD Past, Present, and Future," *Archivaria* 74 (Fall 2012): 7–41.

2 This article is adapted from the second chapter of my master's thesis. Melissa Castron, "Towards Transdisciplinary Archival Strategies: Canadian Cartographic Materials in a Digital Context" (MA thesis, University of Manitoba, 2020), 27–57.

3 Kit Hughes, "Appraisal as Cartography: Cultural Studies in the Archives," *American Archivist* 77, no. 1 (2014): 281.

the “the silences and contradictions that challenge the apparent honesty of the image.”<sup>4</sup> With attention to the implications of the concept of total archives and to the strategy of macroappraisal, I will explore the gap between the developments in archival theory and the management of non-textual materials.<sup>5</sup> I will focus on the Canada Land Inventory (CLI), a program that ran during the 1960s and 70s. This project produced a significant quantity of cartographic materials – including the Canada Geographic Information System (CGIS), the world’s first geographic information system (GIS) – and played a crucial role in the development of digital cartographies in North America.<sup>6</sup> The CLI and CGIS established impactful concepts of land use and development that were promoted first by the settler-colonial state but have also been employed in support of Indigenous land claims.<sup>7</sup> This exploration of the management of materials from CLI is in part a response to Terry Eastwood’s assertion that “the archival discipline consists in building knowledge about archival documents and acting upon them in methodical ways to protect the properties that they have.”<sup>8</sup> By extension, our ability to build archival knowledge of materials in the spirit of reconciliation and decolonization extends to the theoretical underpinnings that can expand our understanding of how we create and interact with non-textual records.

My focus on the CLI and CGIS was fuelled by an interest in materials that demonstrate the variety of outcomes and impacts that mapping has had and continues to have in a Canadian context. Although the CLI was a federal initiative and a highly centralized endeavour, the activities involved in creating and preserving these materials have taken place largely on the peripheries and in the

4 John B. Harley, *The New Nature of Maps: Essays in the History of Cartography*, ed. Paul Laxton (Baltimore: Johns Hopkins University Press, 2001), 152–153.

5 Catherine Bailey, “From the Top Down: The Practice of Macro-Appraisal,” *Archivaria* 43 (Spring 1997): 123.

6 Peter Schut, who was part of the team that worked to save the CLI data and the CGIS system from obsolescence in the 1990s, characterizes the CGIS quite vividly as a “truly revolutionary idea, and from its ambitious beginnings, CGIS ultimately grew to contain the equivalent of thousands of maps. It also spawned an industry that today is worth billions of dollars. CGIS was a home grown software.” Peter Schut, “Back from the Brink,” *Geospatial World*, November 20, 2010, <https://www.geospatialworld.net/article/back-from-the-brink/>.

7 For example, the Inuit Land Use and Occupancy Project of the 1970s was initiated by Inuit Tapirisat of Canada (now Inuit Tapiriit Kanatami), and the ILUOP report was used during the negotiations for two land claim agreements: the 1984 Inuvialuit Final Agreement and the 1993 Nunavut Land Claims Agreement. The maps compiled made use of early GIS technology. Milton M.R. Freeman, “Looking Back – and Looking Ahead – 35 Years After the Inuit Land Use and Occupancy Project,” *Canadian Geographer* 55, no. 1 (2011): 25, 27.

8 Terry Eastwood, “What is Archival Theory and Why is it Important?” *Archivaria* 37 (Spring 1994): 125.

interstitial spaces of Canadian geography. The prioritizing of these peripheral connections within the archives is evident in the changing approaches to cartographic materials at LAC. A particularly interesting example of non-textual, multimedia records are those produced through the use of geographic information systems (GIS). Addressing the various aspects of the CLI and associated CGIS in an archival context, I will first discuss the relevant theoretical and methodological elements of archiving and map-making. A brief history of the CLI and CGIS will follow, concluding with a look at the trajectory of these materials *after* creation. As this article will demonstrate, the active parties behind the creation of these materials used technologies designed to meet parameters defined by the state, thereby shaping the land itself with data collection focused on a fixed set of possible uses and outcomes. I suggest that the nature of these materials can be better understood by incorporating a transdisciplinary approach with existing archival practices.

## Theoretical Contexts:

### Cartographic Materials and Archives

Until quite recently, only a limited amount of archival literature directly addressed cartographic records. This relative inattention pushed maps to a peripheral position in archives. Research on these materials lacked the interdisciplinary scope afforded to other materials.<sup>9</sup> Archivist Andrew Janes suggested that archivists might “draw cartographic records away from the ‘margins of archivry’ and closer to the heart of reflective professional practice.”<sup>10</sup> This archival shift could be supported through an assessment of maps as cultural artifacts with broad significance, as Terry Cook had hoped.<sup>11</sup> Discarding notions of maps as objective, “scientific” documents, and adopting an understanding of maps as nuanced primary source material, developments in both cartographic

9 Kara A. Quann, “Remapping Archives: Cartographic Archives in Theory and Practice at the Provincial Archives of Manitoba” (MA thesis, University of Manitoba, 2001), 26.

10 Andrew Janes, “Of Maps and Meta-Records: Eighty-Five Years of Map Cataloguing at the National Archives of the United Kingdom,” *Archivaria* 74 (Fall 2012): 120.

11 Terry Cook, “A Reconstruction of the World: George R. Parkin’s British Empire Map of 1893,” *Cartographica* 21, no. 4 (1984): 53.

and archival studies suggest a reinterpretation of the map as a recordkeeping technology rather than a discrete item. For example, Janes' assessment demonstrates that even a printed map can be updated or changed over time. A map can also be reused regardless of whether any alterations have taken place. He suggests that a more appropriate concept is a *map-making continuum*, with multiple stages of creation.<sup>12</sup> Rather than conceptualizing the map as a single, finished document, the expansion of cartographic theory encourages a much more nuanced reading, potentially affecting the way archivists handle the materials produced by map creators.

Geographer Matthew Edney asserts that the best way to study maps starts with process rather than product. This processual approach to cartography shares some parallels with the archival trajectory suggested by Brien Brothman, Terry Cook, and Joan M. Schwartz in the 1990s and 2000s, as they encouraged a shift in focus from the content of records to the context of record creation. This approach also mirrors elements of macroappraisal.<sup>13</sup> "It is not that there is one phenomenon (map) which comes in many variants," Edney explains, "but many different phenomena that can be arranged along a continuum only on the basis of a superficial characteristic. The proper subject of analysis is therefore not maps but the mapping processes that gave rise to them."<sup>14</sup> Terry Cook argues for a focus on provenance-based information retrieval, aided by authority records generated through archival knowledge of records creation. Instead of discarding existing methodology and theory, he suggests that archivists would do better to adapt to change and address challenges by reinforcing this knowledge. Cook then goes further, stating that instead of assessing value by examining records themselves, "the secret to appraising records is to put a bag over them, and focus on the context of their creation," including their use – asserting the concep-

12 Andrew Janes, "Maps as a Recordkeeping Technology," *Journal of the Society of Archivists* 32, no. 1 (2011): 119, 122.

13 Matthew Edney, "What Is a Processual Approach to Mapping?" *Mapping As Process* (blog), January 11, 2018, <https://www.mappingasprocess.net/blog/2018/1/11/what-is-a-processual-approach-to-mapping>.

14 Edney, "What Is a Processual Approach?"; Brien Brothman, "Orders of Value: Probing the Theoretical Terms of Archival Practice," *Archivaria* 32 (Summer 1991): 91; Terry Cook, "Fashionable Nonsense or Professional Rebirth: Postmodernism and the Practice of Archives," *Archivaria* 51 (Spring 2001): 15; Terry Cook, "What Is Past Is Prologue: A History of Archival Ideas Since 1898, and the Future Paradigm Shift," *Archivaria* 43 (Spring 1997): 17–63; Joan M. Schwartz and Terry Cook, "Archives, Records, and Power: The Making of Modern Memory," *Archival Science* 2, no. 1–2 (2002): 1–19; Terry Cook and Joan M. Schwartz, "Archives, Records, and Power: From (Postmodern) Theory to (Archival) Performance," *Archival Science* 2, no. 3–4 (2002): 171–185.



tual character of the records over the physical.<sup>15</sup> According to Tom Nesmith, societal provenance functions as a “societal dimension” that permeates all other provenance-related information.<sup>16</sup> Like the processual approach to maps, societal provenance is part of a more fluid understanding of records. However, making such a change is not simple on a practical level, as Nesmith notes. Elsewhere, Nesmith considers the impact of an expanded notion of contextuality on both defining relevant concepts, such as societal provenance, and then incorporating this understanding into regular archival work.<sup>17</sup> For example, formal descriptive standards pay little attention to documenting “much of the subsequent custodial history of the records prior to archiving, the interventions of the archivists, and the uses and impact of the records across time.”<sup>18</sup>

Like J.B. Harley, archivist Hugh Taylor entreated his colleagues to redefine their approach to documents, in particular, as Lori Podolsky Nordland notes, to read them “against the grain” and “redefine the map as a representation of power as much as it is a representation of geography.”<sup>19</sup> The development of archival postmodernism supports the reframing of cartographic records as interstitial types of records (embedded in the histories of technology and social justice movements, rather than simply a part of historical cartography), and creates space for collaborative research, though the approach cannot be applied to all the challenges represented by these materials.<sup>20</sup> William Rankin argues against the common perception that more accurate mapping leads to better maps (and more power over the landscape). He refers to his approach as an exploration of how geographical knowledge is produced, why it takes certain forms, and

15 Terry Cook, “Macroappraisal in Theory and Practice: Origins, Characteristics, and Implementation in Canada, 1950–2000,” *Archival Science* 5, no. 2 (2005): 116–117, 123.

16 Tom Nesmith, “The Concept of Societal Provenance and Records of Nineteenth-Century Aboriginal-European Relations in Western Canada: Implications for Archival Theory and Practice,” *Archival Science* 6, no. 3 (2006): 352.

17 Tom Nesmith, “Reopening Archives: Bringing New Contextualities into Archival Theory and Practice,” *Archivaria* 60 (Fall 2005): 260.

18 Nesmith, “Reopening Archives,” 270.

19 Nordland draws this connection from Harley and Taylor’s writing from the late 1980s. Lori Podolsky Nordland, “The Concept of ‘Secondary Provenance’: Re-interpreting Ac ko mok ki’s Map as Evolving Text,” *Archivaria* 58 (Fall 2004): 147; John B. Harley, “Deconstructing the Map,” *Cartographica* 26, no. 2 (1989): 1–20; Hugh Taylor, “Transformation in the Archives: Technological Adjustment or Paradigm Shift?” *Archivaria* 25 (Winter 1987–88): 12–28.

20 Quann notes that applying postmodern theory “effectively strips away the apparent shell of objectivity which once legitimized map archiving.” Quann, “Remapping Archives,” 45.

how it is known and used. He uses the term *geo-epistemology* to describe this framework of knowledge production, noting that while it is about the way users know and understand their surroundings, it is also about perceptions of trustworthiness, and “above all it is about the importance – and the unavoidability – of tools; the goggles of geo-epistemology come in many styles, but they can never be removed.”<sup>21</sup> The geo-epistemology that forms the foundation of any group of cartographic records is an important aspect of the history of those records. Cartographer Margaret Wickens Pearce explains that academics have also begun to assess Indigenous cartographic materials on their own terms rather than continually comparing materials that document disparate world views using a single Euro-centric standard. She explains that this distinction highlights, for example, the inscriptive nature of non-Indigenous cultures, which store information for later use, in contrast to the incorporative nature of Indigenous cultures, which focus on communicating knowledge directly.<sup>22</sup>

From creation to preservation, each interaction between cartographic materials, producers, researchers, and archivists will add layers of meaning and metadata.<sup>23</sup> I have found this concept to be useful, especially from an archival perspective. Addressing only the information and themes represented by the visual data of a map, without looking further, might seem like a straightforward way to deal with cartographic materials. After all, as T.R. Schellenberg stated, cartographic and pictorial records have traditionally been characterized as “mainly important from the point of view of their subject matter, not from the point of view of their provenance and functional origins.”<sup>24</sup> However, the archival task of establishing the relevant relationships between records suggests that the value of cartographic records should more logically be predicated on the availability of contextual metadata and supporting documentation *in addition* to knowledge of the content of a published map. Supporting materials provide

21 William Rankin, *After the Map: Cartography, Navigation, and the Transformation of Territory in the Twentieth Century* (Chicago: University of Chicago Press, 2016), 2.

22 Margaret Wickens Pearce, “Indigenous Cartographies,” in *Encyclopedia of Geography*, ed. Barney Warf (Thousand Oaks, CA: SAGE Publications, 2010), 1562.

23 Greg Bak identifies these layers of content and metadata as inherently useful to archivists, noting that there is a “need to create systems that register and leverage the social worlds navigated by our records and our users.” Greg Bak, “Not Meta Just Data: Redefining Content and Metadata in Archival Theory and Practice,” *Journal of Archival Organization* 13, no. 1-2 (2016): 15.

24 T.R. Schellenberg, *The Management of Archives* (New York: Columbia University Press, 1965), 325.

researchers or archivists with important resources and perspectives they need to understand the processes that culminate in a single map. The map, much like the statement, as Foucault defined it, “circulates, is used, disappears, allows or prevents the realization of a desire, serves or resists various interests, participates in challenge and struggle, and becomes a theme of appropriation or rivalry.”<sup>25</sup> Cartographic materials should not be approached through a framework that prioritizes the content of a map, which represents only one interpretation of collected data.<sup>26</sup> I am particularly interested in the ways in which traditional and contemporary methodologies intersect through collaborative approaches to cartographic challenges. Thus far in my research (which is by no means *finished* or contained by a rigid boundary), the most compelling definition of the map – which can be seen both as an intersection between science and art and as a cultural artifact – might be Foucault’s definition, quoted above, of the statement. In this sense, a postmodernist approach in fact forms a solid framework from which to address cartographic materials.<sup>27</sup> While I was initially inclined to believe that it does so, this approach is complicated not only by an archival relocation but also by the settler-colonial context of Canadian institutions.

Herman R. Friis describes maps and their “accessorial data” as “accumulating, often as heterogeneous masses of records of numerous different sizes and shapes, they have long taxed the patience of archivists and frequently have become fugitive records.”<sup>28</sup> Archivists routinely place maps, along with architectural plans and drawings, in designated storage locations due to their fragility and their often oversized formats. Writing on National Archives map-handling practices, Friis notes that “graphic mediums, such as the index maps so often used

25 Michel Foucault, *The Archaeology of Knowledge*, trans. A.M. Sheridan Smith (London: Routledge, 2002), 118.

26 For two other examples of the varied types of uses to which non-textual records can be put, see Anastasia Rodgers, “Constructing Beauty: The Photographs Documenting the Construction of the Bloor Viaduct,” *Archivaria* 54 (Fall 2002): 72–91; Jill Delaney, “An Inconvenient Truth? Scientific Photography and Archival Ambivalence,” *Archivaria* 65 (Spring 2008): 75–95.

27 Tom Nesmith, “Seeing Archives: Postmodernism and the Changing Intellectual Place of Archives,” *American Archivist* 65, no. 1 (2002): 26.

28 In this article, Friis confirms that the practice of addressing content first was encouraged for archivists working with cartographic materials, largely to dispel any misgivings harboured about the wide range of materials and formats these records are found in. Herman R. Friis, “Cartographic and Related Records: What Are They, How Have They Been Produced and What Are Problems of Their Administration?” *American Archivist* 13, no. 2 (1950): 138.

for published maps issued in series, are particularly helpful finding aids.”<sup>29</sup> Maps are often printed with a date and author and publisher names included. This gives the impression that such records might be best approached like published books. However, Schellenberg cautioned against this understanding since it fails to address the “aerial character [of the map] and ignores the methods of map compilation and the differences between the development of map printing and book printing. The visual character of a map can be grasped by considering the amount of text required to explain the spatial relations on even a simple map. Difficulties begin shortly after the title is read.”<sup>30</sup> This concern with the inadequacies of the bibliographic approach aligns with the more recent critique of *Rules for Archival Description (RAD)* by Richard Dancy, who noted that RAD is outdated, unwieldy, and difficult to adapt to new challenges (most notably digital objects).<sup>31</sup> Other descriptive standards, such as the *ISAD(G): General International Standard Archival Description*, developed in response to the nature of archival materials rather than by adapting an existing standard taken from another field.<sup>32</sup> The use of various standards for description, especially in the context of digital materials, further complicates this process. However, there are limitations to any approach that does not address the unique qualities of cartographic materials, which, as Schellenberg wrote, layer the concepts of text and image. Ralph E. Ehrenberg recommends that an archivist be familiar with cartographic records but also “survey all of the related records that are produced in conjunction with maps” in order to form as complete an understanding as possible of the records during appraisal, acquisition, arrangement, and description.<sup>33</sup>

29 Friis, “Cartographic and Related Records,” 153–154.

30 Schellenberg, *The Management of Archives*, 303.

31 Dancy, “RAD,” 8.

32 This is evident in the table comparing the two descriptive standards, where Dancy points out several common elements but also demonstrates the inefficiency of including elements that are seldom needed in archival contexts (such as Edition, Publisher’s series, and Standard number) or that push a substantial amount of descriptive information into one place (such as the Note area, which can include up to 30 separate elements). Dancy, “RAD,” 15–17.

33 Ralph E. Ehrenberg, *Archives and Manuscripts: Maps and Architectural Drawings*, The Society of American Archivists Basic Manual Series (Chicago: Society of American Archivists, 1982), 11. This recommendation aligns with the notion of the map as one record within a larger recordkeeping system. Maps are also a deceptively simplistic means of integrating theoretical concepts and images in a graphic format that can then obscure what is “in reality, a complex, multidimensional process.” Arthur H. Robinson and Barbara Bartz Petchenik, *The Nature of Maps: Essays Toward Understanding Maps and Mapping* (Chicago and London: University of Chicago Press, 1976), 1, 85.

The preservation of cartographic materials relies on the skills of professionals who are willing to augment their knowledge and acquire necessary skills over time. Writing on conservation in map collections, Betty Kidd states, “map curators can provide such care by using a combination of common sense and knowledge, both practical and technical, most of which is not taught in any course. Practising map curators learn through experience, reading in related literature, and discussion with their professional colleagues.”<sup>34</sup> A large map collection will have anywhere from several hundred to millions of items in its holdings, and the primary purpose of the collection will impact all aspects of administration and methods of control.<sup>35</sup> In its report *Mind the Shift: Digital Strategy 2015 and Beyond*, LAC noted that there were “3 million maps, plans and architectural drawings” in its holdings.<sup>36</sup> The description of training Kidd details reveals a certain amount of subjectivity to any and all decisions about cartographic materials, which is relevant to the broader discussion surrounding the assessment of non-textual materials. Ultimately, it points to a certain devaluing of materials that fall outside of text-based or even image-based categories. These records are expected to “speak for themselves”; however, this is an unsuitable way to approach authored materials.<sup>37</sup>

In 2008, Tracey P. Lauriault, D.R. Fraser Taylor, and Peter L. Pulsifer examined the viability of digital maps over time, citing the incorporation of archival preservation strategies at “the point of creation not after the fact” as a key component of long-term accessibility, which further extends Ehrenberg’s recommendation. Their research documents an atlas project from the Geomatics and Cartographic Research Centre (GCRC) at Carleton University and the need for collaborative, interdisciplinary projects such as the 2002–2007 International Research on Permanent Authentic Records in Electronic Systems (InterPARES 2) Project. Tracey P. Lauriault, D.R. Fraser Taylor, and Peter L. Pulsifer, “Will Today’s Internet Maps Be Available Tomorrow? The Preservation and Archiving of the Cybercartographic Atlas of Antarctica Through Action Research,” in *International Perspectives on Maps and the Internet. Lecture Notes in Geoinformation and Cartography*, ed., Michael P. Peterson (Berlin: Springer, 2008), 418; InterPARES 2 Project, “Project Summary,” InterPARES 2 Project, accessed June 18, 2021, [http://www.interpares.org/ip2/ip2\\_index.cfm](http://www.interpares.org/ip2/ip2_index.cfm).

34 Betty Kidd, “Preventative Conservation for Map Collections,” *Special Libraries* 71, no. 12 (December 1980): 529–538.

35 Betty Kidd, “The Administration of a Large Map Collection,” *Library Trends* 29, no. 3 (1981): 475.

36 Library and Archives Canada, *Mind the Shift: Digital Strategy 2015 and Beyond* (Ottawa: Library and Archives Canada, 2015), 2, <https://www.bac-lac.gc.ca/eng/about-us/publications/digital-strategy/Documents/LAC-Digital-Strategy.pdf>.

37 This notion that the records have a “voice” is supported by the representation of the Canada Geographic Information System (CGIS) as a problem-solving system rather than the actual function of the CGIS, the quick collation of geographic information for fast access. Classifying information as knowledge both removes and devalues the human intentions and actions that produce these materials. The CGIS will be further addressed

## Methodological Context: An Ongoing Settler-Colonial Process

When discussing materials that map aspects of the “Canadian” landscape, it is crucial to address these documents as tools of *ongoing* processes of colonization. In response to the historic and perpetual disruptions of Indigenous Peoples’ connections to land and resources, Glen Coulthard and Leanne Betasamosake Simpson have proposed a place-based solidarity enacted through the ethical frameworks they term “grounded normativity.”<sup>38</sup> Through these frameworks, they define settler colonialism as “a structure of domination that is partly predicated on the ongoing dispossession of Indigenous peoples’ lands and the forms of political authority and jurisdiction that govern our relationship to these lands.”<sup>39</sup> Margaret Kovach, drawing on existing Indigenous scholarship, similarly notes that place is the differentiating factor between Indigenous Peoples and also a difference between Indigenous and settler societies.<sup>40</sup> Over the course of my own research, I have noticed that records created within the physical space now known as Canada have been untethered from the conditions of their creation, including especially the dispossession of Indigenous lands over the course of a few generations.<sup>41</sup> The separation of records that are understood as Indigenous (those created either by or about Indigenous Peoples) from other archival records enables settlers and their descendants to maintain their sense of colonialism as a process that has *already happened*

later in this article. Shannon Stunden Bower, “Tools for Rational Development: The Canada Land Inventory and the Canadian Geographic Information System in Mid-twentieth Century Canada,” *Scientia Canadensis* 40, no. 1 (2018): 63. See, also, Terry Cook, “From Information to Knowledge: An Intellectual Paradigm for Archives,” *Archivaria* 19 (Winter 1984–85): 28–49.

38 They refer to “grounded normativity” as “the ethical frameworks provided by these Indigenous place-based practices and associated forms of knowledge” comprised of the “generative relationships and practices that create and maintain Indigenous nationhoods, political practices, sovereignties, and solidarities.” Glen Coulthard and Leanne Betasamosake Simpson, “Grounded Normativity/ Place-Based Solidarity,” *American Quarterly* 68, no. 2 (2016): 254.

39 Coulthard and Betasamosake Simpson, “Grounded Normativity,” 251.

40 Margaret Kovach, *Indigenous Methodologies: Characteristics, Conversations, and Contexts* (Toronto: University of Toronto Press, 2009), 61.

41 Indigenous Elders, knowledge holders, scholars, educators, youth, and TRC perspectives regard the recognition of Indigenous land rights as a prerequisite for reconciliation. Ranjan Datta, “Indigenous Reconciliation: Why, What, and How,” *International Journal of Critical Indigenous Studies* 12, no. 2 (2019): 49, 59.

when it comes to cartographic records and the significance of their creation, use, and reuse.

This failure to take responsibility or develop personal connections to decolonization and reconciliation processes can also be connected to the “post-” designation. Linda Tuhiwai Smith explains that “naming the world as ‘post-colonial’ is, from Indigenous perspectives, to name colonialism as finished business,” which is not the reality in a place where settler society remains the dominant force of government, education, and culture.<sup>42</sup> Tuhiwai Smith further critiques the notion of a “postmodern” society in noting that Indigenous resistance to colonization and pursuit of justice has continued regardless of these designations.<sup>43</sup> Coming to know the past, a part of the critical pedagogy of decolonization, is a process of reclaiming Indigenous histories colonized by dominant Western narratives and world views.<sup>44</sup> Taiaiake Alfred states that, for Indigenous Peoples, “colonization is disconnection from the land.”<sup>45</sup> A reassessment of cartographic materials that incorporates a transdisciplinary approach can aid in the development of archival processes that might better identify the map as a form of colonization rather than an impartial collection of data.

### **Case Study: The Canada Land Inventory and the Canada Geographic Information System**

The CLI, which can currently be accessed online through Agriculture and Agri-Food Canada (AAFC) and the Canadian Soil Information Service (CanSIS), is described by the government of Canada as

a comprehensive multi-disciplinary land inventory of rural Canada, covering over 2.5 million square kilometers of land and water. Land capability for agriculture, forestry, recreation, wildlife (ungulates and

<sup>42</sup> Linda Tuhiwai Smith, *Decolonizing Methodologies: Research and Indigenous Peoples*, 2nd ed. (London: Zed Books, 2012), 101.

<sup>43</sup> Tuhiwai Smith, *Decolonizing Methodologies*, 35–36.

<sup>44</sup> Tuhiwai Smith, *Decolonizing Methodologies*, 36.

<sup>45</sup> Taiaiake Alfred, “Don’t Just Resist. Return to Who You Are: Let’s Re-experience Our Homelands the Way Our Ancestors Did and Regenerate That Culture,” *YES* 14, no. 85 (2018): n.p.

waterfowl) was mapped. Over 1,000 mapsheets at the 1:250,000 scale were created during the 1960s, 70s, and early 80s. Although the information is old, and better information is available for some areas as part of more recent soil surveys, the interpretations are still largely valid, and many jurisdictions still use them for land use planning purposes.

There are seven classes used to rate agricultural land capability. Class 1 lands have the highest and Class 7 lands the lowest capability to support agricultural land use activities. Subclasses are used to identify specific limiting factors for each class.<sup>46</sup>

Scans of the printed maps published under the Agricultural Rehabilitation and Development Act Administration (later the Agricultural and Rural Development Act Administration) in the 1960s and 70s are available to view and download, along with GIS data sets and the CLI and CLI Agriculture themes. The data is free to use with acknowledgement of the AAFC's authorship.<sup>47</sup> At LAC, an archives search shows that materials from the CLI can be found in the Department of Environment Fonds, in the Canada Land Inventory, Lands Directorate series, as a sub-series of the Environmental Conservation Service (ECS) series. Some materials are in a separate accession gifted to the Canada Land Inventory map collection.<sup>48</sup> The custodial history for the materials states that the CLI program was proposed by the Senate of Canada's Special Committee on Land Use in Canada, in 1958, and further developed during the 1961 Resources for Tomorrow conference in Montreal. In 1963, the federal government established the CLI program with an order-in-council authorizing the use of \$25,000,000, over 10 years, to fund the development of the CLI and the creation of a computerized mapping system to support accessibility to the collected data. The federal government coordinated with the provinces through the Department of Regional and Economic Expansion until 1971, when this role was transferred to the Lands Directorate, Department

<sup>46</sup> Government of Canada, "Canada Land Inventory (CLI)," accessed June 18, 2021, <http://sis.agr.gc.ca/cansis/nsdb/cli/index.html>.

<sup>47</sup> Government of Canada, "Canada Land Inventory (CLI)."

<sup>48</sup> Rather than being transferred from other parts of the government, 1,100 CLI maps were gifted to the CLI map collection by Michel A. Comeau in Ottawa, Ontario. This accession is linked to the ECS series in the Related Materials field of the LAC description. Library and Archives Canada, "Canada Land Inventory Maps"; see the search results at <https://collectionscanada.gc.ca/>.



of the Environment.<sup>49</sup>

English geographer Roger Tomlinson is credited with developing the Canada Geographic Information System (CGIS), the first operational GIS in the world, with a computer system developed by IBM to accommodate the Canada Land Inventory (CLI).<sup>50</sup> Tomlinson characterized geographic information systems, which in the 1960s were then being developed by various sectors to meet specific requirements, as “a digital system for the analysis and manipulation of a full range of geographical data, with associated systems for inputting such data and for displaying the output of any analyses and manipulations. In geographical information systems the emphasis is clearly on these latter functions, which provide the main motivation for using digital methods.”<sup>51</sup>

In 1967, while working as a data processing coordinator for the Agricultural and Rural Development Administration (ARDA) on the CLI, Tomlinson wrote an introductory text on the CGIS.<sup>52</sup> He explained that the Canadian government, coming to terms with the difficulties of developing natural resources on such a large scale, established ARDA to assess how best to collect and utilize data on “land, water, and human resources.”<sup>53</sup> The CLI was compiled in an effort to collect this data, while the CGIS allowed access to this extensive data in a manageable format. Supported by the CGIS, the CLI functioned as an automated resource for mapping and analyzing “land capabilities for agriculture, forestry, recreation, and wildlife for the purposes of regional planning.”<sup>54</sup> Historian Shannon Stunden Bower cites a 1954 article by geographer F. Kenneth Hare

49 See Library and Archives Canada, Custodial History, Canada Land Inventory (CLI) [cartographic material (electronic)], Environmental Conservation Service [textual record, cartographic material] R653-261-3-E.

50 Jean Thie, “Canada Geographic Information System (CGIS),” in *Encyclopedia of Geographic Information Science*, ed. Karen K. Kemp (Los Angeles: SAGE Publications, 2008), 18.

51 In his article, Tomlinson focused on forestry, property and land parcel data, utilities, transport, facility and distribution planning, civil engineering, and agriculture and environment. R.F. Tomlinson, “Current and Potential Uses of Geographical Information Systems: The North American Experience,” *International Journal of Geographical Information Systems* 1, no. 3 (1987): 204.

52 R.F. Tomlinson, *An Introduction to the Geo-Information System of the Canada Land Inventory* (Ottawa: Agriculture and Rural Development Administration, 1967).

53 Tomlinson, *An Introduction*, 1.

54 Heather McAdam-Ferrarotto and Susan Mowers, *Putting Canada Back on the Map: The Need for Updated Maps of Canada*, ACMLA/ACACC Policy Brief (Ottawa: Association of Canadian Map Libraries and Archives and Canadian Association of Research Libraries, 2007), 2, [https://acmla-acacc.ca/docs/ACMLA\\_Policy\\_Brief\\_Feb\\_2007.pdf](https://acmla-acacc.ca/docs/ACMLA_Policy_Brief_Feb_2007.pdf).

as the first call for a “national inventory of land and resources.”<sup>55</sup> This suggestion was then firmly tied to the notion of “future prosperity” by the federal and provincial governments that later supported the CLI.<sup>56</sup> I would like to emphasize the links between mapping initiatives and the notion of “rational” development of natural resources, a “land inventory,” and Canadian settler colonialism as relevant contextual elements of cartographic materials for archivists. Stunden Bower states that “development,” as both an ideology and a practice, is visible in the federal government’s ARDA legislation:

Development involved deliberate, government-led efforts to change human behavior, and especially behavior related to natural-resources use, thought by proponents to lead to improved outcomes in line with urban-industrial modernity. Importantly, this conception of modernity, development’s implied endpoint, was narrow. The development imperative animating mid-twentieth century federal-government policy was fueled by the presumption that the lifestyles believed to characterize prosperous urbanized and industrialized areas were good for everyone and desired by most, and that those who did not seek them needed assistance in adjusting their aspirations.<sup>57</sup>

The use of the CGIS to accommodate the data collected in the CLI was presented as a practical solution to the abundance of map sheets generated by a nation-wide resource mapping project.<sup>58</sup> The CGIS consisted of two parts, which Tomlinson described as the data bank and the information system. The data bank held the collected data, while the information system consisted of the “set of procedures and methods for moving the data into the bank, and for carrying out the manipulations, measurements, and comparisons.”<sup>59</sup> Tomlinson explained that subsequent policy and planning summaries would generate an estimated 30,000 map sheets of varying scales, creating a situation “where

<sup>55</sup> Quoted in Stunden Bower, “Tools for Rational Development,” 44.

<sup>56</sup> Stunden Bower, “Tools for Rational Development,” 45.

<sup>57</sup> Stunden Bower, “Tools for Rational Development,” 46.

<sup>58</sup> A diagram showing the flow of data preparation procedures appears in Tomlinson, *An Introduction*, 9.

<sup>59</sup> Tomlinson, *An Introduction*, 3.

the amount of data precludes their use.”<sup>60</sup> Human interventions could not produce meaningful, timely analysis for administrative purposes; therefore, a “system whereby the map and related data could be stored in a form suitable for processing by a computer, which is also a computer-oriented system capable of rapid measurement and comparison of the data,” was designed and developed in 1963, with routine use scheduled for September of 1967, the year Tomlinson published his *Introduction*.<sup>61</sup>

Data input involves multiple steps, using multiple machines, and takes time to ensure the materials are accessible through the system’s data base.<sup>62</sup> The drum scanner provides “rapidity, accuracy, low cost, and the handling of a large number of maps. Line following digitizing, using a digitizing table, is also available for both polygon and point data. All image and descriptive data is carefully edited to ensure an error free data base.”<sup>63</sup> This description of the scanning process demonstrates the significant human intervention that took place between compiling and scanning, or digitizing, the maps created for the CLI. A processual approach to the study of maps promotes analysis that considers production, consumption, and circulation equally, emphasizing a deliberate separation from “the well-established teleologies of cartographic progress.”<sup>64</sup> Similarly, it could be productive to disentangle similar categories in an archival context, elaborating on the distribution and subsequent uses of mapped data in addition to their production, starting with the inclusion of the creator’s name in the archival description.

The CLI program spanned the 1960s and 70s, and I initially imagined that

60 Tomlinson, *An Introduction*, 2.

61 Tomlinson, *An Introduction*, 2.

62 Tomlinson states that scanning a full-sized map (48" × 48") using the drum scanner would take 15 minutes, including time for mounting and dismounting the map. Smaller sheets would take less time, but this would vary according to size. Tomlinson, *An Introduction*, 8. David Millar’s 1968 documentary film also demonstrates this process: the National Film Board of Canada’s description notes that the short “examines the workings of this new and mysterious machine” – “the Canada Land Inventory Geo-information System.” It is interesting to note that, over 50 years later, the characterization of the system as mysterious still encourages the viewer to overlook the human intervention that creates both the system and the data it holds. *Data for Decision*, directed by David Millar (Ottawa: National Film Board of Canada, 1968), accessed June 18, 2021, [https://www.nfb.ca/film/data\\_for\\_decision/](https://www.nfb.ca/film/data_for_decision/).

63 An illustration of the CGIS scanning and digitizing processes can be seen in Terry Fisher and Connie MacDonald, “An Overview of the Canada Geographic Information System (CGIS),” in *Auto-Carto* 4, no. 1 (1979): 611-612.

64 Edney, “What Is a Processual Approach?”

the CLI records could offer some insight into the transformation of technologies and approaches over time. Since the CGIS materials were produced with the intention, from the start, of retention, they should reveal in some ways a best-case scenario for the preservation of cartographic materials. In fact, the opposite occurred. Peter Schut, who began working at AAFC in 1992, recounts the decline of the CGIS and the near complete loss of the CLI data in a 2010 article, where he makes several observations that highlight the ambiguous role of technology in records creation and the importance of deliberate and early preservation strategies for digital materials. By the late 1980s, he explains, the CGIS was no longer in use, and when he began to search for the CLI data that might support his own work, only one person had kept the “boxes and boxes of tapes, and racks of documentation that was useless without a computer to run it on.”<sup>65</sup> Despite the cost and time that had gone into the CLI program, no one was officially responsible for the materials. The first adversary of the map – digital or paper – remains obsolescence. Whether that means, as R.A. Skelton stated, that the purpose of the map has been met, the information has been updated, or the form has deteriorated, this aspect of mapping is not unknown (or even new).<sup>66</sup> In 1998, Schut relates, a group of “empowered employees and one private citizen determined to see it through” successfully recovered the CGIS database, along with CLI themes, after years of uncertainty. The themes are now in the public domain. “The CLI is safe,” wrote Schut, “for now.”<sup>67</sup> What is unclear is the amount of contextual information that is accessible to potential users; the motivations behind the CLI program affected what kinds of data were collected as the primary function of the program was to further resource development – a designation that carried a specific meaning within the social and economic frameworks of a modern, post-war Canada.

Tomlinson indicated that, during the early years of the development and use of GIS, documentation of the creation and implementation processes was not centralized in a meaningful way. In the late 1980s, he expressed concern that the federal government had neglected to conduct comprehensive appraisals of the

<sup>65</sup> Schut credits Vee Neimanis, the last person responsible for the decommissioned CGIS, with the foresight to keep the data in case it could be recovered for future use. Schut, “Back from the Brink.”

<sup>66</sup> R.A. Skelton, *Maps: A Historical Survey of Their Study and Collection* (Chicago: University of Chicago Press, 1972), 28–32.

<sup>67</sup> Schut “Back from the Brink.”

uses of GIS or to capture information about practical experiences of working with the technology.<sup>68</sup> Addressing this gap, Tomlinson discussed GIS in relation to five sectors: (1) forestry; (2) property and land parcel data; (3) utilities, transport, facility, and distribution planning; (4) civil engineering; and (5) agriculture and environment. He listed the crucial ways each sector impacted the technology and the challenges faced by both developers and users. Tomlinson explained that “the human problem” was the most significant hurdle for a more widespread use of GIS. Peter Schut’s experience with the CLI confirms that the concerns Tomlinson expressed regarding general neglect and lack of documentation were replicated in other areas as well. This perceived shortcoming is connected to the introduction of new technology, “which requires not only a new way of doing things, but also has as its main purpose permitting the agency to do many things which it has not done before and often does not understand.”<sup>69</sup> This description of the challenges involved in the use of GIS is particularly relevant when considering the challenges faced by the archivists who then take custody of the materials created through fast-paced technological change.<sup>70</sup> It is also relevant

68 Tomlinson, “Current and Potential Uses,” 203–204.

69 Tomlinson, “Current and Potential Uses,” 211. In this climate of new experiences and unknown outcomes, a critical perspective toward GIS began to take shape. By the early 1990s, scholars in the field, such as Jeremy Crampton, Trevor Harris, John Pickles, and Nicholas Chrisman, supported an expanded conceptualization of GIS; beyond the technical exercise, users and developers were encouraged to consider GIS as “situated within cultural, social, economic and ethical contexts.” L. Jesse Rouse, Susan J. Bergeron, and Trevor M. Harris, “Participating in the Geospatial Web: Collaborative Mapping, Social Networks and Participatory GIS,” in *The Geospatial Web: How Geobrowsers, Social Software and the Web 2.0 Are Shaping the Network Society*, ed. Arno Scharl and Klaus Tochtermann (London: Springer, 2007), 154.

By 2005, some geographers were pondering whether critical theory could retain a place in GIS. Francis Harvey, Mei-Po Kwan, and Marianna Pavlovskaya note that, despite a wider acceptance and interest in critique within their field, “‘critical GIS’ [remained] an oxymoron for many GIS users and critical social theorists.” They also describe GIS as one of the most common, but also misunderstood, technologies in contemporary society. Francis Harvey, Mei-Po Kwan, and Marianna Pavlovskaya, “Introduction: Critical GIS,” *Cartographica* 40, no. 4 (2005): 1.

70 Archival scholars are interested in interdisciplinary approaches, in the context of methodologies, and aid in the application of concepts like multiple provenance, as demonstrated in articles by Cook, Eastwood, and Nesmith. Cook, “What Is Past Is Prologue,” 20; Eastwood, “What is Archival Theory?,” 125; Tom Nesmith, “Still Fuzzy, But More Accurate: Some Thoughts on the ‘Ghosts’ of Archival Theory,” *Archivaria* 47 (Spring 1999): 140.

However, there is an important distinction between drawing on external theory and using methodologies to support archival functions. Terry Eastwood notes that the “archival discipline consists in building knowledge about archival documents and acting upon them in methodical ways to protect the properties that they have. Thus, the large theoretical question is what are those properties that need to be protected, and why.” To answer this question, archivists need not look to other fields for their theory but can build it from the inside out. Eastwood, “What is Archival Theory?,” 125.

to considerations of meaningful ways to address and incorporate decolonization and reconciliation approaches into archival processes. However, while there were challenges involved in ensuring access and preserving data collected for the CLI, the shortcomings that Tomlinson later identified in the field did not preclude a positive assessment of the geographic information system as a model for archivists to study. I will turn to the GIS as a model for archival processes.

In response to Cook's article on the threat of a "tyranny of the medium,"<sup>71</sup> Dorothy M. Ahlgren and John McDonald presented GIS, in 1981, as a starting point to achieve a version of Cook's proposed virtual unification across media through description.<sup>72</sup> GIS processes rely on an approach to creation that upholds provenance despite media segregation. Departing from Cook, Ahlgren and McDonald cautioned against rejecting media specialization. Although a fixation on the medium carried a real risk of compromising contextual information, specialization also challenged archivists to broaden their understanding of the record to include those other than traditional text-based documents.<sup>73</sup> Information systems, like the CGIS, could only be adequately managed by exploiting the deep technical knowledge that Ahlgren and McDonald suggested was the positive side of media specialization. An archivist responsible for an entire system would need to consider the impact of fragmentation on the integrity of archival materials even when the structure of the system was relatively simple. The authors explained that, to appropriately acquire a multimedia system like the CGIS in the late 1970s, "policy documents, maps, magnetic tapes, reports, and aerial photographs would have to be preserved," with four or more divisions of the Public Archives of Canada responsible for preservation of these materials.<sup>74</sup> However, the organic whole of the information system is the most important part of the implementation of control functions. Rather than focusing on the physical separation necessitated by preservation strategies, the archivist should be compelled to maintain the intellectual integrity of the system by relying on established archival approaches, thus acquiring both the form and the substance

71 Terry Cook, "The Tyranny of the Medium: A Comment on Total Archives," *Archivaria* 9 (Winter 1979-1980): 141-149.

72 Dorothy M. Ahlgren and John McDonald, "The Archival Management of a Geographic Information System," *Archivaria* 13 (Winter 1981-82): 59.

73 Ahlgren and McDonald, "Archival Management," 60.

74 Ahlgren and McDonald, "Archival Management," 63.

of the system, its content, and its meanings.<sup>75</sup>

Tom Nesmith states that “the archival history essay could offer a broad outline of the main types of contextual information relevant to the archives’ holdings” and that a conceptual approach, developed from a more agile and dynamic descriptive standard reflected in theory developed by Wendy Duff and Verne Harris, “relates both what may not yet be known about records in actual custody and what may be known about records not in custody.”<sup>76</sup> Nesmith noted that an effective approach would “base archival work on as much knowledge of the multiple provenances, many contexts of creation, or the overall history of the records as can be obtained – and then use the power of this provenance information to locate, appraise, describe, make available, interpret, preserve, and protect the integrity of the records.”<sup>77</sup> This type of approach to cartographic materials could be a useful step in establishing more nuanced interpretations and additional uses for materials viewed as technical or scientific. The narrative quality of the map and the privileging of specific themes and societal values should be highlighted as aspects of the potential uses and reuses of these kinds of materials beyond recycling collected geographic data. Joan M. Schwartz notes that the impact of the “iconic revolution”<sup>78</sup> of the nineteenth century has received only scant attention from archivists. Schwartz discusses the perception of the photograph, relative to maps and geological surveys, as an “objective record of reality,” largely due to the misconception of mechanical processes as neutral.<sup>79</sup> This misconception also extends to the hardware and software used to collect and present quantitative and qualitative geographic data. It is important to see the human hand that creates and uses these tools.

75 Ahlgren and McDonald, “Archival Management,” 64. This example also demonstrates that, while the challenges of preserving cartographic materials – as part of a system and for the long term – have only recently become an area of importance for cartographers, archivists have been thinking about these challenges for decades. See Lauriault, Fraser Taylor, and Pulsifer, “Will Today’s Internet Maps Be Available Tomorrow?”; InterPARES 2 Project, Tracey P. Lauriault, and Yvette Hackett, “Cybercartographic Atlas of Antarctica,” Case Study 06 Final Report (InterPARES 2 Project, 2007), [http://inter pares.org/ip2/ip2\\_case\\_studies.cfm?study=5](http://inter pares.org/ip2/ip2_case_studies.cfm?study=5).

76 Nesmith, “Reopening Archives,” 272.

77 Tom Nesmith, “What’s History Got to Do With It?: Reconsidering the Place of Historical Knowledge in Archival Work,” *Archivaria* 57 (Spring 2004): 27.

78 Joan M. Schwartz, “Negotiating the Visual Turn: New Perspectives on Images in Archives,” *The American Archivist* 67 (Spring/Summer 2004): 108.

79 Joan M. Schwartz, “‘We Make Our Tools and Our Tools Make Us’: Lessons from Photographs for the Practice, Politics, and Poetics of Diplomats,” *Archivaria* 40 (Fall 1995): 44.

Using Canadian government records, including cartographic materials and court and other legal documents, Haudenosaunee historian Susan M. Hill was able to trace the persistence of traditional Haudenosaunee values operating within the colonial system in her book *The Clay We Are Made Of: Haudenosaunee Tenure on the Grand River*. Traditional practices of property dispersal and concepts of land ownership, community resources, and intergenerational roles and responsibilities are visible to a reader of these documents who has access to specific types of knowledge and experience.<sup>80</sup> However, established archival practices can separate the materials from the contributors who made their creation possible. As Greg Bak notes, archives are not simply passively accumulated but are actively created. Terms that indicate they are created through passive or organic processes “mask social and professional/cultural forces that define theory and practice of archives, including what counts as an archival record, the pathways by which records may arrive at the archives, and the role of the archivist in creating the archives.”<sup>81</sup> Jennifer Douglas recognized that the conventions of archival theory discourage archivists from preparing descriptions that deviate from the “traditional notions of archives as impartial and natural and of archivists as objective and neutral.”<sup>82</sup> Her assessment was made in the context of writers’ archives and focused on three different ways in which these fonds can be manipulated: first, by the creator of the archives; next, by the archivist; and finally, by other interested parties.<sup>83</sup> In the context of cartographic materials, this observation is also relevant; as the history of the CLI and CGIS demonstrates, the active parties behind the creation of these materials were using technologies designed to meet the parameters of processes perceived by government as modernization and development toward future prosperity. The land was shaped by the data collection, which focused on a fixed set of possible uses and manipulated possible outcomes. Not only are these materials and data sets still in use (through CanSIS), the content can be accessed without the

<sup>80</sup> Susan M. Hill, “The Clay We Are Made Of: Haudenosaunee Land Tenure on the Grand River” (2018 James A. Jackson Memorial Lecture, University of Manitoba, Winnipeg, March 1, 2018). See, also, Susan M. Hill, *The Clay We Are Made Of: Haudenosaunee Land Tenure on the Grand River* (Winnipeg: University of Manitoba Press, 2017).

<sup>81</sup> Bak, “Not Meta Just Data,” 2.

<sup>82</sup> Jennifer Douglas, “Toward More Honest Description,” *American Archivist* 79, no. 1 (2016): 50.

<sup>83</sup> Douglas, 27.



context, which positions the federal government as an active creator rather than a neutral collector of this index of natural resources.<sup>84</sup> While there is a marked difference between the experience of reading through the online LAC descriptions of the CLI data and that of downloading the CLI themes from the CanSIS website, the perception of maps as data repositories rather than as “value-laden products of human activity” is the primary outcome in both cases.<sup>85</sup> If these human activities are well-documented in archival descriptions, the nature of the materials becomes more transparent.

The perception of archivists as cartographers, noted at the beginning of this article, is not necessarily shared by cartographers or geographers. The near total loss of the CLI materials demonstrates that the development of professional partnerships and collaborations (like those that produced the CLI in the first place) should also include efforts by archivists to clarify and share their knowledge of what is included in archival processes. The documentary heritage of these lands takes as many forms as there are methods of communication. A processual approach, which is an expansion of the postmodern reading of maps and their associated materials, addresses this specific type of record and the way it is *actually* used. This is perhaps an uneasy position for an archivist to inhabit, as the interpretation of records is not generally perceived as a part of the job description. However, in understanding the history of the record, it is possible to include multiple layers of provenance as well as multiple layers of impact. Shifts from the centre to the periphery – taking a process- rather than product-centred approach – could provide pathways toward a better understanding of the impact of these documents and their continued use. Such shifts require a transdisciplinary approach to these records. The intention here is to draw attention to the record as more than cartographic materials, though this classification is certainly still useful to certain types of research. The overarching goal is to include information that clearly identifies the materials as authored where possible or points to gaps where they exist. For example, the Government of Canada notes that while the information in the CLI printed maps and data sets “is old, and better information is available for some areas as part of more recent soil surveys, the

84 As Terry Cook and others noted, the medium itself is part of the message; context (such as physical characteristics) is “not a luxurious frill but essential knowledge to permit the location and appraisal of records, their arrangement and description, and their intelligent use by all manner of researchers.” Terry Cook, “Legacy in Limbo: An Introduction to the Records of the Department of the Interior,” *Archivaria* 25 (Winter 1987–88): 82.

85 Quann, “Remapping Archives,” 36.

interpretations are still largely valid, and many jurisdictions still use them for land use planning purposes.”<sup>86</sup> However, the influence of quantitative geography was at work in the original development, which prioritized what has been termed a “god’s-eye view.”<sup>87</sup> In Stunden Bower’s estimation, this approach “failed not only to encompass the historical processes that created patterns of inequality, but also to accommodate the perspectives of those with different ambitions for the future.”<sup>88</sup> This assessment connects to the conceptualization of the map as a form of “presentational symbolism,” which depicts a view that has never actually been experienced by those involved, whether as map creators or map users.<sup>89</sup> In archival contexts, there is an opportunity to acknowledge this disparity, perhaps most noticeably (to archival researchers) in additional description but also in more subtle ways that could affect processes of arrangement or terms of access.

## Conclusion

This case study illustrates the persistent rift between theoretical developments and archival practice, while also underscoring the role of both cartography and archives in the formation of Canada as a modern colonial state and in the ongoing dispossession of Indigenous Peoples. Arguing that an archival shift in the conceptualizations of cartographic materials is necessary to more accurately reflect the impact of cartography and cartographic materials, I have explored the management of materials from CLI in response to Eastwood’s assertion that “the archival discipline consists in building knowledge about archival documents and acting upon them in methodical ways to protect the properties that they have.”<sup>90</sup> Cartographic materials, like other non-textual materials, should be understood and contextualized with attention to their positioning within a recordkeeping system and as cultural artifacts rather than as technical documents. Critical attention to the subjectivity of maps, archives, and digital technologies has

<sup>86</sup> Government of Canada, “Canada Land Inventory (CLI).”

<sup>87</sup> Geographer Trevor J. Barnes, quoted in Stunden Bower, “Tools for Rational Development,” 64.

<sup>88</sup> Stunden Bower, “Tools for Rational Development,” 64.

<sup>89</sup> Robinson and Bartz Petchenik, *The Nature of Maps*, 53.

<sup>90</sup> Eastwood, “What is Archival Theory?,” 125.

the potential to enhance and expand descriptive standards in the archives while also contributing to more diverse and creative uses for these materials that transcend their creators' original use or intention. Incorporating a transdisciplinary approach to these materials, I suggest archival adaptations of a processual approach to cartographic records and the inclusion of geo-epistemologies in the process of description.

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